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MEMORANDUM

SUBJECT: Section 18-Use of Myclobutanil on hops in Oregon, Washington, and Idaho

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A. Risk Characterization Summary

The proposed use of myclobutanil on hops in Oregon, Washington, and Idaho does not appear to pose adverse effects to birds or fish. There is a possibility of acute risk to small mammals from maximum short grass residues; these residues exceed restricted use criteria. Additionally, there is a possibility of chronic hazard to small mammals exposed to average short grass residues; this would most likely occur in edge habitat, not in the hops field itself. Precautions to minimize spray drift onto edge habitat should minimize this risk. There is also a possibility of acute risk to endangered small mammals from maximum short grass, tall grass, broadleaf plant, and insect residues; however, there are no endangered small mammals listed for the counties indicated in the exemption request. Likewise, there is a potential for acute risk to endangered marine/estuarine invertebrates and freshwater mollusk species, but there are no endangered or threatened species of these types listed for the proposed counties. Risk to nontarget plants could not be assessed due to lack of data; therefore, risk to plants remains a possibility, which could be minimized by taking precautions to minimize spray drift. Risk to nontarget insects could not be assessed due to lack of data; therefore, risk to nontarget insects remains a possibility from the proposed use of myclobutanil.

B. Submission Purpose

The Oregon, Washington, and Idaho Departments of Agriculture have applied for a special exemption to use Rally 40 WSP fungicide containing myclobutanil on a total estimated 44,454 acres (Washington-32,214 acres, Oregon-8,351 acres, Idaho-3,889 acres) of hops crops to treat powdery mildew (*Sphaerotheca macularis)*. The maximum estimate for total required active ingredient is 53,345 lb ai for the season. This is based on up to 8 applications of Rally 40 WSP at

10 oz.(0.25 lb ai) per acre applied by air or ground sprayer at first vine emergence, which occurs about 15 March. Applications are to be made with a maximum treatment interval of 10 days, with a 14 day interval prior to harvest. Since myclobutanil will be used in conjunction with tebuconazole and fenarimol, the grower believes he can push his re-treatment interval to the longest recommended time. The only alternative method of control is sulfur, which was reported by growers to provide inadequate protection or control when used as a single compound. In addition, sulfur caused considerable phytotoxicity damage. There are no other alternative cultural control practices available at this time. Since the powdery mildew on hops was not seen in the Northwest until 1997, there is no efficacy data available. European greenhouse data was not sufficient to separate the three pesticides, but did show protection of hops from powdery mildew. The greenhouse data also indicated that the powdery mildew in the Northwest is different from that present in Europe. Due to the limited experience with the disease, the economic impact is difficult to project. Experience in 1997 indicates that once the disease is established, a losing battle is fought for the remainder of the season and that 80% of the U.S. acreage planted is susceptible to the disease.

Product Information:

Product Name: Rally 40 WSP manufactured by Rohm and Haas Co.
Active Ingredient: Myclobutanil.....40%
Inert Ingredients.....60%

Rally 40 WSP contains 3.2 lb ai/gallon of product.

C. Environmental Assessment

1. Environmental Fate and Exposure Characterization

Environmental Fate Data:

- Stable to hydrolysis at pH 5, 7, and 9
- Stable to photolysis in water
- Photolytic soil half-life = 143 days
- Aerobic soil half-life = 66 days
- Anaerobic soil half-life = no degradation at 62 days
- Terrestrial Field Dissipation half-life = 292 days in sandy loam, and 92 days in loam soil. No apparent leaching was observed at either site.
- solubility = 142 ppm
- Leaching: myclobutanil is moderately mobile (K_ds = 1.46 - 9.77 for adsorption and 0.47 - 4.18 for desorption in 5 soils), with a median K_{oc} = 581. The degradate (1,2,4-triazole) is considered highly mobile, with a median K_{oc} = 104 (average of 112) .

The major route of dissipation is believed to be diffusion and dilution; myclobutanil appears to be resistant to most environmental breakdown processes.

2. Estimated Environmental Concentration

Aquatic

The aquatic EECs presented below were generated using the GENEEC computer program developed by EFED. This program uses a variety of environmental fate parameters in conjunction with the application rate to estimate the exposure to aquatic organisms from runoff. With an application rate of 0.25 lb a.i./A and a maximum of 8 applications at a 10 day intervals per year, the GENEEC simulation model for ground application yields a peak EEC value of 34.58 ppb and an average 56-day EEC of 27.60 ppb.

GENEEC EECs (µg/L) for Myclobutanil Use on Hops

INPUT VALUES

RATE (#/AC) ONE(MULT)	APPLICATIONS NO.-INTERVAL		SOIL KOC	SOLUBILITY (PPM)	% SPRAY DRIFT	INCORP DEPTH(IN)
.250 (1.670)	8	10	581.0	142.0	1.0	0

FIELD AND STANDARD POND HALFLIFE VALUES (DAYS)

METABOLIC (FIELD)	DAYS UNTIL RAIN/RUNOFF	HYDROLYSIS (POND)	PHOTOLYSIS (POND-EFF)	METABOLIC (POND)	COMBINED (POND)
129.00	0	N/A	0.00-0.00	0.00	0

GENERIC EECs (IN PPB)

PEAK GEEC	AVERAGE 4 DAY GEEC	AVERAGE 21 DAY GEEC	AVERAGE 56 DAY GEEC
34.58	34.07	31.36	27.60

Terrestrial--Acute

Vegetation Type	Maximum EEC[1]	Average EEC[1]
Short grass	401 ppm	262 ppm
Tall grass	187 ppm	122 ppm
Broadleaf plants/insects	227 ppm	148 ppm
Fruits/seeds	27 ppm	17 ppm

[1]From FATE program-- based on 8 applications at 10 oz product (0.25 lb ai)/A with a 10-day application interval. Initial concentration was the maximum Kenaga value for the vegetation type.

Terrestrial--Chronic

Vegetation Type	Maximum EEC[1]	Average EEC[1]
Short grass	140 ppm	92 ppm
Tall grass	60 ppm	39 ppm
Broadleaf plants/insects	73 ppm	48 ppm
Fruits/seeds	12 ppm	8 ppm

[1]From FATE program--based on 8 applications at 10 oz product (0.25 lb ai)/A with a 10-day application interval. Initial concentration was the mean Fletcher value for the vegetation type. Average EEC is for a 100-day period from the initial application.

3. Ecological Toxicity Data Summary

The following toxicity data has been reviewed in conjunction with registration of myclobutanil.

Terrestrial Wildlife Toxicity Data

Common Name	%AI	Toxicity	NOEL	EPA-ID	CATEGORY
Bobwhite Quail	84.5	LD_{50} 510 mg/Kg		0144286	C
Bobwhite Quail	84.5	LC_{50} >5000 ppm		0144287	C
Mallard Duck	84.5	LC_{50} >5000 ppm		0144287	C
Bobwhite Quail	94.2	LOEC >260 ppm	260 ppm	43087901	S
Mallard Duck	94.2	LOEC >260 ppm	260 ppm	43087902	S
Laboratory rat	91.9	Acute oral LD50=1360 g/kg		006370	C
Laboratory rat	84.5	2-gen. Repro LOEL=1000 ppm	200 ppm	004936	C
Laboratory rat	84.5	2-gen. Systemic LOEL=200 ppm	50 ppm	004936	C

Aquatic Organism Toxicity Data

Common Name	%AI	Toxicity	NOEL	EPA-ID	Category
Bluegill sunfish	84.5	96 HR LC50=2.4 ppm		0144285	C
Rainbow trout	84.5	96 HR LC50=4.2 ppm		0141677	C
Water flea	84.5	48 HR EC_{50} =11 ppm		0141678	C
Sheepshead minnow	93	96 HR LC_{50} =4.7 ppm		42747903	C
Eastern oyster	93	96 HR EC_{50} =0.68 ppm		42747901	S
Mysid	93	96-HR LC50 = 0.24 ppm		42747902	C
Fathead minnow		Early life LOEC=2.2 ppm	0.98 ppm	0266119	S

4. Hazard Assessment

Terrestrial Organisms

Acute Risk Quotients (RQs)

Vegetation Type	Max EEC	Avian acute RQ---max	Mammal acute RQ--max[1]
Short grass	401	0.08	0.28 b
Tall grass	187	0.04	0.13 c
Broadleaf plants/insects	227	0.04	0.16 c
Fruits/Seeds	27	0.00	0.02

[1] Based on a calculated mammal LC50 of 1432 ppm for a small mammal consuming 95% of its BW (LD50/% BW consumed)
a=high risk LOC exceeded
b=restricted use LOC exceeded
c=endangered species LOC exceeded

The restricted use level of concern (LOC) is exceeded for small mammals by maximum expected residues of myclobutanil on short grass. The endangered species LOC is exceeded for small mammals by maximum expected residues on tall grass, broadleaf plants, and insects.

Chronic Risk Quotients

Vegetation Type	Average EEC[1]	Avian Chronic RQ	Mammalian Chronic RQ: Reproductive	Systemic
Short grass	92 ppm	0.35	0.46	1.84 a
Tall grass	39 ppm	0.15	0.20	0.78
Broadleaf plants/insects	48 ppm	0.18	0.24	0.96
Fruits/seeds	8 ppm	0.03	0.04	0.16

[1]Average concentration over time (100 day period)--modeled using FATE program with mean Fletcher value as initial input.
a=chronic LOC exceeded

The chronic LOC is exceeded for mammals from the average residue of myclobutanil on short grass.

Aquatic Organisms

Acute Risk Quotients

Species	LC_{50} or EC_{50} (ppm)	Peak EEC (from GENEEC) (ppm)	RQ
Bluegill sunfish	2.4	0.034	0.01
Rainbow trout	4.2	0.034	0.01
Water flea	11	0.034	0.00
Sheepshead minnow	4.7	0.034	0.01
Eastern oyster	0.68	0.034	0.05 c
Mysid	0.24	0.034	0.14 c

a=high risk LOC exceeded
b=restricted use LOC exceeded
c=endangered species LOC exceeded

Endangered species acute LOCs are exceeded for marine/estuarine invertebrates and freshwater mollusks from the proposed use of myclobutanil on hops.

Chronic: The fish early life-stage NOEC (0.98 ppm) was compared to the 56-day GENEEC value (0.028 ppm); no chronic hazard was indicated for the proposed use of myclobutanil on hops.

Terrestrial Plants

No data on toxicity of myclobutanil to terrestrial species of plants has been reviewed to date. Therefore, no conclusions regarding possible hazard to these species groups can be made at this time.

Non-Target Insects Toxicity Data

No data has been received for review by the Agency regarding toxicity to non-target insects. Therefore, no conclusions regarding possible hazard to these species groups can be made at this time.

Endangered Species

Based on toxicity data and predicted environmental concentrations, there is a possibility of acute hazard to endangered small mammals from short grass, tall grass, broadleaf plant, and insect residues; however, there are no endangered or threatened small mammal species listed for the counties covered by the exemption. There is also a possibility of acute hazard

to endangered marine/estuarine invertebrates, which also includes freshwater mollusk species; however, there are no species of this type listed for the counties covered by the exemption. The lack of non-target terrestrial plant data and non-target insect toxicity data precludes any determination of hazard for these species groups. A list of endangered species in the counties for which this Emergency Exemption was requested is attached.

D. Labeling Recommendations

Section 18 Label

Do not apply directly to water, or to areas below the mean high-water mark. Do not contaminate water when disposing of equipment washwater or rinsates.

Product Label

For terrestrial uses, do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters. Do not apply when weather conditions favor drift or runoff from areas treated.

Endangered and Threatened Species Listing:

Washington:

Benton county:	Bald Eagle (bird)
	Peregrine Falcon (bird)
	Snake River Sockeye Salmon (fish)
Yakima county:	Grizzly Bear (mammal)
	Bald Eagle (bird)
	Peregrine Falcon (bird)
	Northern Spotted Owl (bird)
	Gray Wolf (mammal)

Oregon:

Clackamas county:	Nelson's Checker Mallow (plant)
	Oregon Chub (fish)
	Bald Eagle (bird)
	Water Howellia (plant)
	Northern Spotted Owl (bird)
Marion country:	Nelson's Checker Mallow (plant)
	Oregon Chub (fish)
	Bald Eagle (bird)
	Water Howellia (plant)
	Bradshaw's Lomatium (plant)
	Northern Spotted Owl (bird)
	Western Snowy Plover (bird)
Polk county:	Nelson's Checker Mallow (plant)
	Oregon Chub (fish)
	Bald Eagle (bird)
	Bradshaw's Lomatium (plant)
	Marbled Murrelet (bird)
	Northern Spotted Owl (bird)

Idaho:

Boundary county:	Grizzly Bear (mammal)
	Woodland Caribou (mammal)
	Bald Eagle (bird)
	Gray Wolf (mammal)
Canyon county:	Bald Eagle (bird)
	Peregrine Falcon (bird)
	Chinook Salmon (fish)